

the theorem that create influce X



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Influence diagrams were not created by a single mathematical theorem, but were instead introduced as a new modeling framework by decision analysts **Ronald Howard** and **James Matheson** in 1984. They are built upon probability theory, decision analysis, and directed acyclic graphs (DAGs) to represent conditional independence and expected utility. UCLA +4

Core Concepts and Foundations

- **Graph Theory:** Uses nodes and directed edges (arrows) that form no loops to show dependencies.
- **Probability Theory:** Extends [Bayesian networks](#) to handle probabilistic and deterministic variables.
- **Decision Analysis:** Integrates decision choices, chance events, and numerical values/utilities to maximize expected utility. YouTube · CFO Perspec... +3

Key Contributors

- **Howard and Matheson (1984):** Formally proposed [influence diagrams](#) as an intuitive alternative to massive decision trees.
- **Shachter (1986):** Developed the first direct evaluation algorithms to solve these diagrams without converting them back into decision trees. The University of Britis... +3

If you'd like, I can explain:

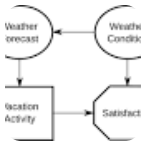
- The **node shapes** used in an influence diagram (rectangles, ovals, octagons)
- How to **solve** an influence diagram
- The difference between **decision trees** and influence diagrams

Wikipedia



Influence diagram - Wikipedia

An influence diagram (ID) (also called a relevance diagram, decision diagram or a decision network) is a compact graphical and mat...



 Project Euclid

Influence Diagrams for Statistical Modelling - Project Euclid

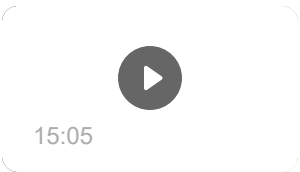
A new decomposition theorem, analogous to Kiiveri, Speed and Carlin and requiring no positivity condition, is proved. Connections ...



Ask anything



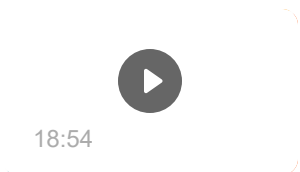
Videos



Muller-Breslau Principle for Influence Lines - Intro to Structural ...

YouTube · Structures with Prof. H
Oct 28, 2021

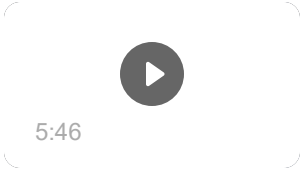
Learn how the Muller-Breslau principle uses unit deformation to find **influence** lines for shear, moment, and reaction forces in structures.



Build an influence diagram with an expert modeler

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]] 8 key moments in this video



Using Influence Diagrams to Map Out Decisions

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4 key moments in this video

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What is the influence diagram?



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What are the components of an influence diagram?



 Wikipedia
https://en.wikipedia.org/wiki/Influence_diagram

Influence diagram

An **influence diagram** (ID) is a compact graphical and mathematical representation of a decision situation. It is a generalization of a Bayesian network, ... [Read more](#)

 ScienceDirect.com
<https://www.sciencedirect.com/topics/engineering/i...>

Influence Diagram - an overview

An **influence diagram** is a general representation of key identified risks, alternatives, and outcomes in a way that represents their interconnectivities and ... [Read more](#)

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Influence Diagrams for Statistical Modelling

by JQ Smith · 1989 · Cited by 153 — A new decomposition **theorem**, analogous to Kiiveri, Speed and Carlin and requiring no positivity condition, is proved. Connections between **influence diagrams**



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Evaluating Influence Diagrams

by RD Shachter · 1986 · Cited by 2043 — An **influence diagram** is a graphical structure for modeling uncertain variables and decisions and explicitly revealing probabilistic dependence and the flow ... [Re...](#)



UCLA

<https://ftp.cs.ucla.edu> › pub › stat_ser

Influence Diagrams and α -Separation - FTP Directory Listing

by T Verma — **Theorem 2:** For any two **influence diagrams**, D and E over the same set of nodes N, $D \Rightarrow E$ if and only if all three of the following hold: 1. $\forall a, a, beN$ parents ...

7 pages



BayesFusion

<https://www.bayesfusion.com> › influence-diagrams

Influence Diagrams

Influence diagrams (IDs) introduced by Howard and Matheson (1984), are acyclic directed graphs modeling decision problems under **uncertainty**. [Read more](#)



The University of British Columbia

<https://www.cs.ubc.ca> › ~crowley › papers › aiproj

Evaluating Influence Diagrams

by M Crowley · 2004 · Cited by 15 — **Influence diagrams** (IDs) were proposed by Howard and Matheson [HM03] as a tool to simplify modelling and analysis of decision trees.

9 pages



SciSpace

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Using Influence Diagrams.

(i.e., **Bayes' theorem**) then the probabilistic influence diagrams are equivalent; i.e., the influence diagrams in Figures 4.1 and 4.3 are equivalent.

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